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(19) (CA) **CANADIAN PATENT** (12)

(54) Insecticidal Natural Bait Composition and Method of
Using Same

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ABSTRACT OF THE DISCLOSURE

Disclosed is an insecticidal composition based on diatomaceous silica and skim milk or skim milk substitute, yeast, preferably yeast extract, or mixtures thereof and a method of using it. This composition is especially useful with flying insects such as mosquitoes and house flies, as well as with crawling insects.

This invention relates to an insecticidal natural bait composition. More particularly, this invention relates to a composition which can be used as a bait for flying and crawling insects and which, by its nature, is capable of killing these insects without polluting the environment. Even more specifically, the invention relates to a method of killing insects using the insecticidal natural bait composition according to this invention.

Presently, there are a large number of insecticidal 10 compositions. Most of them are based on chemicals which are either capable of instantaneously killing insects or can provoke paralysis. With the knowledge which has been acquired on the effects of the insecticidal chemicals, it is well known that these are an important source of pollution. There is therefore presently a tendency to search for ways to get rid of insects without endangering the environment.

One way of doing it is to use a diatomaceous silica also called diatomite which, because of its very small particle size has very sharp edges. Such a composition has been defined 20 in U.S. Patent No. 3,159,536. However, the problem is to succeed in contacting the insects with diatomite, for if no contact is achieved, it is impossible to destroy them.

Presently there is a popular insecticide which is called PERMAGUARD. This composition is made of pyrethrin and a diatomaceous earth. There is just enough pyrethrin in the composition to cause a partial paralysis in the insect, with the result that it is forced to crawl into the diatomaceous earth where it becomes injured and it rapidly dies. However 30 pyrethrin is a polluting agent and furthermore, after eight hours, its effect is completely gone by with the result that the insect does not have a tendency to be in contact with diatomaceous earth.



In my U.S. Patent No. 4,386,071, I have disclosed an insecticidal composition based on diatomaceous earth and a sugar substitute. Although this composition is very useful in destroying crawling insects, it has been found that flying insects such as mosquitoes, house flies, etc. are not attracted by such a composition, and would not touch it even if they would be in contact with it.

There is therefore a need to provide an insecticidal composition which is as much as possible free of polluting chemicals and which, at the same time, is effective in getting rid of insects. It is an object of the present invention to provide a composition which will serve at the same time as an attractant and as a bait to flying insects, as well as other insects.

U.S. Patent No. 3,846,557, inventors M.S. Mulla et al, issued November 5, 1974 describes a method of killing insects using as an attractant a protein from which water has been removed while evolving an attractant gas.

U.S. Patent No. 4,160,824, inventors Inazuka et al, issued July 10, 1979 disclosed a mixture of an insecticide with a protein hydrolyzate. Presumably the protein hydrolyzate serves as an attractant.

Nowhere, however does the art describe a composition which is free of polluting agents and which is an insecticide acting both as an attractant and a bait.

I have found that it is possible successfully to kill flying insects as well as crawling insects by using an insecticidal natural bait composition based on diatomaceous silica, and skim milk or skim milk substitute, yeast or yeast extract, or mixtures thereof.

In accordance with a broad embodiment of the invention, there is provided an insecticidal natural bait com-

position comprising

- a) between about 75 and about 95% by weight of diatomaceous silica having a particle size of at most 50 microns;
- b) between about 5 and about 25 percent by weight of a member selected from the group consisting of skim milk, skim milk substitute, yeast, yeast extract and mixtures thereof;
- c) said composition containing about 1 to about 25 percent by weight water to enable it to be swallowed by an insect, and to prevent said skim milk, skim milk substitute, yeast and yeast extract from being washed away from said composition.

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In order to be effective, it has been found that the composition according to the invention must have a certain percentage of humidity. Preferably, the composition contains about 1 to about 25 percent by weight of water. A preferred composition contains about 5 to about 25 percent by weight of water. Generally, I use a composition containing 5 to about 12 percent by weight of water. A most preferred composition is one in which there is used a diatomaceous earth containing about 5.2 percent by weight of water.

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A preferred diatomaceous silica which can be used in formulating the composition according to the invention is one in which the particle size varies up to at most 50 microns.

Although any diatomaceous silica having the above particle size can be used with success in treating insects, I prefer to use substances made by Johns-Manville and known under the trade marks CELITE 209 and CELITE 322.

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Although skim milk will be used in practice, any skim milk substitute may also be used. The yeast which has been found most effective in attracting the insects in yeast extract.

In order to destroy all kinds of insects, it is merely necessary to contact them with the composition according

to the invention.

In the composition according to the invention, the insect killer is really the diatomaceous earth. This idea is first of all to attract the insects. It is believed that the yeast is mainly responsible to do this while what normally causes the insects to swallow some diatomaceous earth is the skim milk. It is believed, however that there is a combination of effects between the two ingredients, skim milk and yeast, although they both can be used alone in association with the diatomaceous earth and be effective in killing insects. However it is preferred to use a mixture of skim milk and yeast.

10 The invention will now be illustrated by means of the following examples.

Example 1

A room infested with house flies was treated with the following composition:

20 1) CELITE 322 Filler (diatomaceous silica) 90 percent by weight;

2) skim milk 8 percent by weight;

3) yeast extract 2 percent by weight.

The three ingredients were mixed thoroughly in a blender by controlling the humidity to at most 5 percent by weight. The powder composition was sprayed in the room with a rotoduster.

Results:

Fast knock-down of all house flies.

Example 2

The same mixture was used in a room infested with mosquitoes.

30 Fast knock-down of all mosquitoes.

Example 3

The same composition was used in a public toilet infested with latrine flies. After spraying the entire room

with the composition according to the invention, it was realized that two hours after the treatment, all the insects were dead.

Example 4

The same composition was used in a room infested with horn flies. After spraying the entire room with the composition according to the invention, it was realized that two hours after the treatment, all the insects were dead.

Example 5

10 The same composition was used in a room infested with deerflies. After spraying the entire room with the composition according to the invention, it was realized that two hours after the treatment, all the insects were dead.

Example 6

The same composition was used in a grain elevator infested with tribolium. Two hours after the treatment, all the tribolium were dead.

Example 7

Example 6 was repeated using a composition containing
20 90 percent by weight CELITE 322 Filler and 10 percent by weight skim milk. Some success was achieved but not as successful as with the composition of Example 6. The treatment requires more time and is not as drastic in killing insects.

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. An insecticidal natural bait comprising
 - a) between about 75 and about 95 percent by weight of diatomaceous silica having a particle size of at most 50 microns;
 - b) between about 5 to about 25 percent by weight of a member selected from the group consisting of skim milk, skim milk substitute, yeast, yeast extract and mixtures thereof,
 - c) said composition containing about 1 to about 25 percent by weight water to enable it to be swallowed by an insect and to prevent said skim milk, skim milk substitute, yeast and yeast extract from being washed away from said composition.
2. An insecticidal natural bait composition according to claim 1 wherein said composition contains about 5 to about 12 percent by weight of water.
3. An insecticidal natural bait composition according to claim 1 wherein said composition contains about 5.2 percent by weight of water.
4. An insecticidal natural bait composition according to claim 1 wherein said diatomaceous silica consists of CELITE 209.
5. An insecticidal natural bait composition according to claim 1 wherein said diatomaceous silica consists of CELITE 322.

6. An insecticidal natural bait composition according to claim 1 wherein said member comprises a member of skim milk and yeast.
7. An insecticidal natural bait composition according to claim 1 wherein said member comprises skim milk.
8. A method of killing insects which comprises treating an infested area with an insecticidal natural bait which comprises about 90 percent by weight of humidified diatomaceous silica having a particle size of at most 50 microns, about 8 percent by weight skim milk, and about 2 percent by weight yeast extract, said composition containing about 1 to about 25 percent by weight water to enable it to be swallowed by an insect and to prevent said skim milk and yeast from being washed away from said composition.

